

## KEYWORDS

**Expression:** a statement using letters and numbers.

$$3a^2 + b + 1$$

**Equation:** two equal statements or expressions connected by an equals sign (=).

$$3 + x = 3x - 1$$

**Term:** part of an expression or equation.

$$2y; 16c^2$$

**Coefficient:** the number or letter multiplying an algebraic term.

$$5ab; \frac{3d}{4}$$

← use fractions rather than decimals

**Formula:** an equation used to find quantities when given certain values.

$$V = l \times b \times h$$

**Function:** a relationship between dependent variables.

$$f(x) = x^2 + x$$

**Inequality:** a statement that one expression is greater than or less than another.

$$x < 3; y > -2$$

**Brackets:** used to show terms are treated together.

$$2(a + b) = 2a + 2b$$

← Multiply each term inside brackets by the coefficient and remember signs, e.g.  $-3(x - 2y) = -3x + 6y$ . Signs (+ or -) are attached to the term which follows.



Write down any name of four or more letters.  
Write down any non-zero number  $< 10$  under each letter.  
Use a different number for each letter.  
Work out: 1st letter  $\div$  last letter.  
Multiply together: 2nd and alternate letters.  
Add together: 1st and alternate letters.  
Subtract: 4th letter from 3rd letter.



# Algebraic notation

In algebra, numbers are often substituted by letters.

## EXAMPLES

$$a \times b = ab$$

← this is also equal to  $b \times a = ba$

$$c + c + c = 3 \times c = 3c \quad p \div q = \frac{p}{q}$$

$$y \times y = y^2 \quad x \times x \times x \times y \times y = x^3 y^2$$

The letters are **variables** and are usually written in alphabetical order.

$$t \times 3s \times 2r \times 4 = 24rst$$

← variable – a letter taking any value

**Coefficients** are **constants** and are written in front of the letters.

Do not write a coefficient of 1.

$$1a = a$$

Whole term is zero if coefficient is zero.

$$0 \times a = 0$$

## Powers in expressions

**linear expression:** the highest power of the variable is 1.

**quadratic expression:** the highest power of the variable is 2.



1. Simplify each of the following into one term.

(i)  $x \times x \times x \times x$

(ii)  $\frac{y \times y \times y}{y}$

(iii)  $2 \times a \times 3 \times a \times b$

(iv)  $b \times b \times 0$

2. Simplify each of the following into one term.

(i)  $a^3 \times a^5$

(ii)  $b^6 \div b^2$

(iii)  $(c^3)^2$

(iv)  $(d^2)^{\frac{1}{2}}$

3. Simplify each of the following into one term.

(i)  $a + a + a$

(ii)  $b - 2b - c + 2c$

(iii)  $x + x + p + 3$

(iv)  $4 - y + 3y - 1$

4. Multiply out the brackets in each of the following.

(i)  $3(a + 4b)$

(ii)  $-2(2c + 3d)$

(iii)  $5(x - y + z)$

(iv)  $-3(p - q + 2r)$